Jeremy Johnson

STATE OF MISSOURI
Bob Holden, Governor • Stephen M. Mahfood, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

APR

April 21, 2004

Mr. Joseph Haake
Group Manager
The Boeing Company
Dept. 464C, Bldg. 220
Mail Code S221-1400
P.O. Box 516
St. Louis, MO 63166-0516

RE: Comments on the Enhanced Bioremediation Pilot Test Report for the Boeing Facility Hazelwood, Missouri, Permit # MOD00818963

Dear Mr. Haake:

The Missouri Department of Natural Resources' Hazardous Waste Program (HWP) has completed review of the Enhanced Bioremediation Pilot Test Report dated February 3, 2004. This report summarizes the results of the pilot test conducted at the scrap metal recycling dock. These results will be used to form conclusions and recommendations for this remedial technology to be used at other areas of the site. The HWP has comments relating to the pilot study itself as well as extension of the Hydrogen Release Compound (HRC) technology to other contaminated areas at the Boeing facility including Solid Waste Management Unit (SWMU) 17.

SPECIFIC COMMENTS

1. Section 4.2 and 4.3 Pilot Test Design and HRC Injection, page 6.

   The report states that based on the software program provided by the HRC vendor (Regenesis) an appropriate application rate of six lbs. per foot in each injection boring was

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estimated. The actual injection rate used in the pilot test was two lbs. per foot in each injection boring. Please explain why the application rate used was different than the estimated rate.

2. Section 4.5 Pilot Study Site Disturbance, page 8.

The report states that a water line broke approximately 30 feet south of the pilot test area, and was repaired within 24 hours. The volume of water released as a result of the break should be estimated and any influence this break may have had on the pilot test results should be discussed in the report.

3. Section 6 Conclusions, page 12.

The HRC technology appears to have been very effective at facilitating biological degradation of Trichloroethene (TCE) in the subsurface. After three months, TCE concentrations decreased three orders of magnitude. However, this technology does not appear to be as effective at facilitating rapid biological degradation of Dichloroethene (DCE) or vinyl chloride (VC). At the end of the pilot test period (1.5 years), remaining DCE concentrations were the same order of magnitude as the pre-injection levels. In all likelihood, some of the DCE created by the dechlorination of TCE was degraded along with DCE that was pre-existing, although it is impossible to determine the proportion of "new" versus "old" DCE that was degraded. As would be expected, VC concentrations initially increased significantly (from ND to 1000 µg/l). Because VC is more toxic than TCE, this conversion could increase human health risks associated with any complete exposure pathways at the site if continued degradation of VC does not occur.

The report must discuss in greater detail what is believed to be occurring with respect to the DCE and VC concentration trends. Possible factors in this discussion include initial HRC injection volumes and theoretical DCE/VC degradation rates as compared with TCE. Ultimately, the department needs assurances that DCE and VC will be degraded to less toxic compounds and/or site-specific risk-based thresholds and the estimated timeframe for that degradation to occur. Should Boeing decide to propose the HRC injection in the pilot test area as a final remedy for that area, further monitoring will be needed in this area to demonstrate the continued degradation of DCE and VC to below risk-based thresholds. The details regarding any such monitoring would need to be developed as part of any Long-term Operation Maintenance and Monitoring Plan for the site-wide final remedy.

Please revise and resubmit appropriate portions of the Enhanced Bioremediation Pilot Test Report to address the foregoing comments within 15 days of receipt of this letter. If you have

any questions concerning this comment letter or require any additional information, please do not hesitate to contact me by phone at (573) 751-3553 or at the Missouri Department of Natural Resources, HWP, P.O. Box 176, Jefferson City, MO 65102-0176.

Sincerely,

HAZARDOUS WASTE PROGRAM

Patrick Quinn, P.E.
Environmental Engineer
Permits Section

PQ:sw

c: Ms. Joletta Golik, Airport Authority
Mr. Jeremy Johnson, United States Environmental Agency Region VII
St. Louis Regional Office